UNITED STATES PUBLIC HEALTH SERVICE

THE CITIZEN AND THE PUBLIC HEALTH

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HEALTH OUR GREATEST RESOURCE.

In this age we hear much about "conservation of resources." This means that we are awakening to a realization of the fact that we have been spendthrifts; that we have lived for the moment and at the expense of the future.

The greatest asset or resource of a nation is in its healthy citizens—healthy mentally, morally, and physically. While this fact is capable of mathematical demonstration on a statistical basis, it is sufficient here to point out that there can be no nation without citizens, and that a citizen without health is often a minus quantity when resources are being considered. Yet we pay comparatively little attention to, and expend comparatively little money on, the conservation of this great national resource.

Let each one consider what he has lost through sickness and the premature death of those dear to him. How many relatives and friends who helped to make life pleasant and profitable have been taken away or reduced perhaps to becoming mere burdens by sickness? How many times has sickness caused personal suffering, loss of money and productive time, and impaired efficiency and power of enjoyment? Only the citizen who has not lost in this way, and can not fear to lose, can afford to be without interest in public health, for the individual health and the public health are so interwoven that they can not be considered separately.

Disease is not a pleasant thing to contemplate, and interest in it must be regarded as to an extent morbid, unless it has as its ultimate object either cure or prevention. Of these, prevention is logically and practically the more important, and we should direct our efforts against disease, first, to the prevention of such diseases as we can prevent and, second, to the cure of such as we have not yet learned how to prevent. Since diseases exist, it is necessary for us to know certain facts about each, which may be classified as follows: First. To what extent does it exist—how important is it? Second. What are the causes of it? Third. How can it be avoided—how can the causes be attacked? Fourth. How can we cure what we can not prevent?

While there are, unfortunately, great gaps in the answers which we are at present able to give to the preceding questions as regards

many of the diseases which beset us, still we have at the present time sufficient knowledge to enable us to reduce greatly the toll of sickness which is sapping our strength, providing it could be put into practice. And this is just what public health proposes to do—to put into practice the knowledge of the prevention of disease which we have at hand. In the meantime, the gaps in our knowledge are slowly but surely being filled in by an army of patient workers in the cities and in the country, in slums, laboratories, factories, health offices, in legislative assemblies, and wherever knowledge can be gained and applied.

The present article is an attempt to outline the problem of public health so that the citizen may be able to gain an idea of its scope and to appreciate how much of the solution lies in his own hands, and how little of it, outside of the contribution of scientific information, can be accomplished by the medical profession or any other group or class of men. In other words, that it is a problem for every citizen, whether he be a farmer, banker, day laborer, doctor, lawyer, or whatever his occupation may be.

In order to present this matter in the limits of a short article the scheme of tabulation has been resorted to (see p. 9). This method is admittedly imperfect, as it encourages the use of brief statements which, without explanation, may be somewhat misleading. However, it possesses a certain clarity of exposition which is of value for the present purpose, and it is hoped that, with the aid of a general discussion, taking the tables as a text, its purpose may in a measure be accomplished.

There are some omissions from the tables which may at first seem strange. Where, for instance, are the great plagues so called, which history teaches us have at times decimated the peoples of the earth and which even now are raging in certain lands which seem to us remote? Where are the bubonic plague or black death, Asiatic cholera, typhus fever, yellow fever, and smallpox? The answer is, that largely on account of the public health application of our knowledge of these diseases they have been reduced or held in check, so that they now contribute immaterially, if at all, to either our general sickness or death rates.

In their place we have the white plague (tuberculosis), cholera infantum and its kin, typhoid fever, and the pox or syphilis, which are quite as deadly and as much to be dreaded as the others, only they are perhaps not quite as sensational and, moreover, we are used to them. There are some other omissions of diseases which have as yet claimed so little attention that we are unable to speak with any confidence as to how important they may prove to be. A number of these are at present under surveillance by the Public Health Service, and methods for their eradication are being worked out.

THE COMPARATIVE IMPORTANCE OF VARIOUS DISEASES.

Table 1 (page 9) contains most of the diseases which contribute materially to our death rate, arranged in descending order according to the number of deaths they cause annually (census figures for the United States registration area 1910 in round numbers). It must be constantly remembered that these figures represent deaths and not cases of sickness. Many of these conditions assume a much greater importance when we consider that for each death recorded we must also count the weeks, months, or years of suffering and incapacity both of those who die and of those who recover.

Economically, sickness causes greater loss than does death. Diseases which are largely important from this standpoint alone are considered in Table 2. There is one item in the second column of Table 1 which deserves special attention, and that is the number of deaths from diarrhea and enteritis among children under the age of 2. This drain on the resources of the Nation is from a medical standpoint to a large extent preventable and it only remains for the underlying medical principles to be applied in order to secure a considerable reduction in the number of deaths from this cause.

THE CAUSES OF DISEASE AND DEATH.

The next column of the table deals with the exciting or immediate causes of disease, which may require some explanation. Suppose a person has inherited a poor resistance to tuberculosis. Suppose also that he works at metal grinding and inhales a great deal of irritating dust. Here we have ideal predisposing conditions for the development of tuberculosis; but this person will never suffer from the disease unless exposed to infection by the particular germ, *Bacillus tuberculosis*, which is therefore the immediate or exciting cause.

Our imperfect knowledge, however, makes it difficult to carry out a classification of the causes of all diseases with perfect logic and the table exhibits certain marked lapses in this regard. After all, what are the reasons why our bodies stop working and die? The reasons may be classified roughly thus: First, the body may not be a good machine to start with, and, like an ill-made mechanical toy, it may soon break down under stress. An example of this is a marasmic child, born with such feeble assimilative powers that, no matter how much or how good food is presented to it, it steadily fails and dies because it was a poor machine to start with. Second, it may be subject to destructive mechanical or other physical violence—a gunshot, a thunderbolt, a heat stroke. Third, its air or food supply may be shut off—drowning, starvation. Fourth, it may be exposed to the action of substances which we call poisons; and these are so various as to require special explanation.

There are, of course, the vegetable and chemical poisons, like strychnine and prussic acid, which are formed outside of our bodies and which injure or kill us if taken in. But there are also poisonous substances formed inside of our bodies all the time, even in health, which cause damage if they are formed in excess of our ability to get rid of them. And, again, there are poisons formed by various animal or vegetable parasites, popularly known as germs, which get into our bodies and thrive there at our expense.

A word here about what is still referred to as the "germ theory" of disease. In the first place, it is not a theory, but a hard fact. The typhoid bacillus, for instance, is just as concrete a fact as the man he infects.

As a fifth general cause of death we have, all too rarely, that wearing out of a good machine, which we call old age. Finally, we have various combinations of these causes, which may at times be so confused and complicated that we are entirely unable to name the most important one.

While bacteriology and allied sciences have succeeded in showing that the exciting causes of many diseases are specific germs, and in many cases have pointed the way to the elimination of certain diseases by attacking or avoiding these organisms, they have also shown that the problem is in many cases not so simple. For example, although we try our best to keep the germs of tuberculosis from getting from sick persons to healthy ones, our efforts in this direction are probably much less efficacious in preventing consumption than those larger measures which tend to provide a healthful environment and proper diet for our population. Here, as in many other conditions, our best line of defense seems to be in the direction of maintaining or increasing the resistance of our bodies to infection.

Now, concerning the predisposing causes of disease, it may be said that lack of knowledge is the foremost in importance—ignorance of the causes and the means of prevention not only among the people at large but even among those specialists who are working hard to dispel the clouds which still hide many a secret from us. No less important is the failure to avail ourselves of what knowledge we have. And then the immense importance of unfavorable special and economic conditions must be emphasized. As long as we have poverty and ignorance we must expect also disease. One of the chief ways in which poverty encourages disease is through overcrowding, and this can only be corrected by adjusting those conditions which permit of sweatshops and seething tenements.

THE PREVENTION OF DISEASE.

The prevention and the cure of any harmful condition consist logically in eliminating the cause. In order to do this it is necessary, first, to ascertain the cause and find out all we can about its method of operation. For this reason time and money and effort spent

in research into the cause of disease are well spent, and offer as great a yield on the principal invested as any other form of investment that can be mentioned. The truth of this statement is well illustrated in the fact that insurance companies, having business reasons for desiring the reduction of disease, justly expend large sums on research.

Another form of research no less important is into the distribution and prevalence of disease; in other words, the collection of morbidity reports and statistics. These two—research as to the cause of disease and its method of spread, and research as to the occurrence and prevalence of disease—give us the information obtained in times of war by means of scouts and spies; the number and position of the enemy's forces, their arms and supplies, and their plan of attack. This knowledge once gained we are in a position to devise a system of protection. Expert judgment is necessary here to determine what lines of action are calculated to give the best practical results.

Whether to attack the germ which causes a given malady, whether to rather build up the individual resistance, either by protective inoculation or by hygienic measures, or whether to abandon the attack along medical lines altogether and proceed against a social abuse are problems requiring much expert wisdom for their solution. At any rate, the education of the individual citizen in the essentials of the subject is a very necessary part of any public health movement. The average American citizen, at least, is of an inquiring disposition; he wants to know why, and it is only when he knows why that the most effective action can be got out of him.

When we come to the application of our knowledge we find that while each individual can do much to safeguard the health of himself and his family by observing the rules of personal and domestic hygiene, there is a great part of the work that can be accomplished only by the concerted action of many individuals; in other words, by public agencies. We find also that in many cases it is expedient to attack rather the predisposing than the exciting cause of a disease, and that in many instances this is possible only through social reforms which at first sight may seem to have only a remote bearing on the public health.

What can the individual citizen do toward the elimination of disease? First, it is necessary that he take an active interest in the subject. If the Nation at large only took as much interest in its health as it does in politics or in baseball we should have cleaner politics and more time for baseball. When one's interest is once aroused, the problem of getting information is not usually a difficult one. In this country we regard education as a birthright, and to obtain it we establish free schools and libraries everywhere. We should demand that these institutions educate us in the matter of keeping well. Insist that your public libraries carry a full line of

literature on public health subjects and on personal hygiene, and then patronize the library. Insist that in your free schools there be liberal and obligatory courses in hygiene, and see to it that your children profit by them. If your children profit by them, so will their parents.

An illustration directly in line with this is in the case of the corn clubs which have, in some districts, taught boys in their "teens" to raise two and three times as much corn per acre as their fathers have ever been able to do. When the schools shall have taught children to love fresh air and to cook digestible food, the parents may have some unpleasant reminiscences of unnecessary doctor and undertaker bills of years past. A liberal course in physiology and hygiene does not consist only of the old fashioned tirade against alcohol and tobacco, important though these subjects are. It should teach the principles and practice of using air, light, water, food, clothing, exercise, and dwellings to the best advantage of the human body and mind; and surely there is nothing that children can learn in school that will be of more assistance to them.

Then there are the health boards as sources of information. Why not be in as close touch with your local, State, and Federal health agencies as the progressive farmer is with the corresponding agricultural agencies? The majority of State health boards and many municipal boards now publish bulletins on timely subjects in a comprehensible and practical form.

Now, as to what the citizen can do to secure his own and his neighbor's health through public agencies. He will have done much if he has prepared himself by private study and by availing himself of opportunities for acquiring solid information to understand the reasons and the necessity for various public health activities, and if he has seen to it that his children have been properly instructed in the care of their bodies. Wherever there is not already an efficient public health service it behooves the citizen to use his vote and his personal influence to secure one; and once having secured it, he must encourage and support it to the best of his ability.

There are certain provisions in the selection of an executive health officer which should always receive attention. He should be, to a degree, a specialist in public health and not merely a prominent or successful practitioner of medicine. Where his office deals with the health of a considerable population, say a town of 20,000, he should devote all his time to the duties of his office and should, of course, be paid for all his time. He should be freed so far as possible from the limitations imposed by politics. He should be supported by liberal appropriations with which to carry out the functions of his office.

Where a community is too small of itself to provide a well-equipped health service, it is often practicable by combining interests with neighboring communities to secure the most efficient service at reasonable cost.

Some of the most important public health work has been initiated and is still being carried on by private or, at least, unofficial charitable

agencies. This means that it has not been or is not being adequately attended to in an official way. In some cases the public agencies have been simply incompetent; in some there have been legal limitations to the scope of their activities; in many cases they have been inadequately supplied with funds and equipment.

We must render due thanks and honor to the charitable workers who have contributed so much to public health accomplishment; but there is just one thing wrong with even the most intelligent charity, and that is, there should be no occasion for it. We do not feel ourselves the subjects of charity in sending our children to public schools. When we shall have learned to organize, equip, and maintain our public health agencies on broad, intelligent lines we shall receive our health, as we do our schooling, not as charity but as a birthright.

NOTE.—In studying the tables which follow it is to be borne in mind that the number of deaths caused by a disease does not indicate the seriousness of that disease from a public health standpoint or from the standpoint of the welfare of the community. Pneumonia, which heads the list in Table 1 as being the most frequent cause of death, does not cause so great an injury to the community as does malaria in malarious districts or hookworm disease in localities badly infected by it. Both malaria and hookworm disease sap the strength of the people, render them inefficient, and make prosperity impossible.—EDITOR.

TABLE I.—THE PRINCIPAL CAUSES OF DEATH.

Name or group of disease.	Deaths per 100,000 a year.	Exciting cause.	Contributing and predisposing causes.	Prevention in general.
All causes.	1,495	Congenital inefficiency. Germ diseases. Poisons from within or without the body. Accident. Old age.	Ignorance of causes, prevention and cure. Failure to apply knowledge. Economic and social conditions.	Research into causes, prevention and cure. Application of knowledge. Extension of vital statistics Education. Economic adjustment.
Pneumonia.	148	Pneumococcus and other germs, often harbored by healthy people.	Overcrowded and overheated buildings, cars, etc. Dusty surroundings and trades. Bad personal hygiene. Exposure to wet and cold. Influenza, measles, etc.	Sanitation of buildings, cars, streets, etc. Abatement of smoke and dust. Protection of workers in dusty occupations. Hygiene of teeth, clothing, exercise. Avoidance of exposure.
Organic heart disease.	142	Infections with various germs. The poisons of preceding disease. Chemical poisons, alcohol, lead. Mechanical causes.	Rheumatism, tonsillitis, chorea, syphilis, gonorrhea, nephritis, gout. Poisonous trades, alcoholism. Severe work, or athletics. Heredity.	Avoidance of these infections. Protection of workers. Control of alcoholism. Substitution of machinery in very laborious trades. Sane athletics.
Tuberculosis of the lungs.	140	Bacillus tuberculosis. Other germs secondarily.	Sick persons at large. Promiscuous spitting and coughing. Overcrowding, bad ventilation. Common drinking cups. Sedentary and dusty trades. Hereditary predisposition. Infected cattle and their milk.	Reporting and recording of all cases. Public sanatoria for the sick. Education of consumptives. Abolish spitting habit. Regulation of overcrowding. Good ventilation. No common drinking cups. Protection of workers. Discouragement of the marriage of the tubercular. Public control of the milk supply. Open-air schools.

TABLE I.—THE PRINCIPAL CAUSES OF DEATH—Continued.

Name or group of disease.	Deaths per 100,000 a year.	Exciting cause.	Contributing and predisposing causes.	Prevention in general.
Diarrhea and enteritis under the age of two years.	101	Germs of the typhoid, dysentery, and other groups. Hot weather.	Factory employment of mothers. The abandonment of breast nursing. Ignorance of the care of infants. Impure milk for the artificial feeding of infants. Overcrowding. Heat. Poverty. Filth. Flies. Impure drinking water.	Education of mothers in the importance of breast feeding and the care of infants. Public control of the milk, and water supplies and of overcrowding and lighting of buildings, and of disposal of stable refuse to abolish flies.
Nephritis (Bright's disease).	99	Poisons of various origins, in attempting to get rid of which the kidneys suffer.	Scarlet fever, gonorrhea, syphilis, and other infections. Over eating and indulgence in alcohol. Too strenuous mental and physical life. Exposure to wet and cold. Metallic poisons.	Economic adjustment. The avoidance of these infections. Personal hygiene in eating and drinking. Adjustment of activities to personal equipment. Avoidance of exposure. Protection of workers in certain trades.
Violent deaths.	90	Various forms of physical violence.	Dangerous occupations. Imperfections in transportation facilities. Social conditions and diseases tending to the production of criminals.	Regulation of dangerous employments to protect workers. Prevention of travel accidents by safety appliances, etc. Social adjustment. Control of sale of alcohol, habit-forming drugs, and of venereal disease.
Cancer.	76	Unknown.	Unknown in many cases. Certain occupations. Continuous local irritation. Injuries at childbirth often due to unskilled attendance. Heredity. Contact.	Research into causes. Avoidance of these dangers. Securing higher standards of obstetrical practice. Nonmarriage of those having marked family tendency.
Cerebral hemorrhage (apoplexy).	76	Arterial disease.	Similar to those of heart disease.	Similar to that of heart disease.
Congenital debility and malformations.	75	Nutritional, mechanical or toxic influences operating before birth.	Abnormalities in one or both parents, syphilis, alcoholism, malnutrition, insanity. Accident.	Combating these conditions, which see. Economic adjustment in favor of working women.
Typhoid fever.	24	Bacillus typhosus and allied germs.	Failure to dispose properly of the dejecta of previous cases. Late diagnosis. Contamination of water, milk, or food. Bacillus carriers, human and fly.	Early reporting of all cases. Thorough disinfection at the bedside of each case. Surveillance during convalescence. Public control and private attention to water, milk, and food supplies and sewage disposal. Public laboratory assistance of doctors in diagnosis. Hospitalization of the sick. Campaign against flies. Immunization with vaccine.
Bronchitis.	23	Various bacteria.	Same as pneumonia.	Same as pneumonia.
Diphtheria and croup.	21	Bacillus diphtheriæ.	Intimate contact in schools, churches, theaters, tenements, asylums. Unrecognized bacillus carriers. Common cups, etc. Infected milk, ice cream. Delayed diagnosis and treatment.	Early diagnosis and reporting of cases, assisted by public laboratory. Public provision for rendering antitoxin available to all sick and exposed persons. Isolation of the sick and exposed. Control of milk. Abolishing common drinking cup.

TABLE I.—THE PRINCIPAL CAUSES OF DEATH—Continued.

Name or group of disease.	Deaths per 100,000 a year.	Exciting cause.	Contributing and predisposing causes.	Prevention in general.
Other respiratory diseases.	16	Various bacteria. Irritating dusts and gases. Poisons due to other diseases.	Similar to pneumonia. Diseases of the eliminating organs.	Similar to pneumonia. Largely personal hygiene.
Suicide.	16	Poisons. Asphyxia. Violence.	Insanity, mental and physical suffering, poverty, ill health, overwork, social evils. Ignorance of essentials.	See Table II, Insanity.
Puerperal diseases.	16	Various bacteria. Poisons formed within the body.	Injuries during childbirth, frequently due to ignorant attendance. Preceding infections. Bad hygiene of pregnancy. Venereal disease.	Higher standards of medical practice and control of midwives. Control of venereal disease. Instruction in hygiene of pregnancy.
Diabetes.	15	Poorly understood. Sometimes tubercle bacilli. Poisons formed within the body.	Severe mental strain. Sedentary habits. Dietary faults. Hereditary influence.	Principally personal hygiene. Fatal termination often postponed by regulation of habits.
Influenza.	14	Bacillus influenzæ.	Same as pneumonia.	Same as pneumonia.
Meningitis (non tubercular).	14	Diplococcus meningitidis, and other bacteria.	Same as pneumonia. Late diagnosis. Lack of serum treatment.	Same as pneumonia and public assistance in early diagnosis, and securing serum for epidemic form.
Cirrhosis of the liver.	14	Poisons and germs from without. Poisons from within.	Preceding infections. Syphilis and alcohol. Bad personal hygiene, especially dietetic.	Similar to nephritis. Control of venereal diseases and alcoholism. Personal hygiene.
Hernia and intestinal obstruction.	12	Congenital defects. Acquired defects. Death often caused by bacteria.	Straining occupations. Cough diseases. Constipation. Gonorrheal infection of women. Anything causing peritonitis.	Hospital and dispensary treatment. Control of venereal disease. Personal hygiene, good musculature.
Measles.	12	Unknown parasite.	Unnecessary exposure to previous cases. Overcrowding. Ignorance of dangers.	Similar to pneumonia. Isolation of the sick. Education in dangers. Open-air schools.
Tuberculosis (other than of lungs and meninges).	12	Bacillus tuberculosis.	Exposure to previous cases or their discharges. Hereditary tendency. Infected milk.	Same as tuberculosis of the lungs.
Scarlatina.	12	Unknown parasite.	Same as measles. Infected milk.	Same as measles and control of milk supply.
Pertussis (whooping cough).		A bacillus.	Same as measles.	Same as measles.
Appendicitis.	11	Various germs.	The appendix. Various infectious diseases. Dietary faults.	Timely, skillful surgery. Avoidance of infections. Dietary hygiene.
Tuberculous meningitis.	9	Bacillus tuberculosis.	Same as tuberculosis of the lungs.	See tuberculosis. Especially avoid contact of tuberculous persons with children.
Rheumatism.	7	Various bacteria.	Hereditary tendency. Bad personal hygiene in eating, exercise, and clothing. Neglected teeth or throat disorders.	Research into causes. Personal hygiene, especially of mouth. Early treatment of throat diseases.

TABLE II.—ADDITIONAL CAUSES OF SICKNESS—DISEASES CONTRIBUTING PRINCIPALLY INDIRECTLY TO THE DEATH RATE—IMPORTANT SINCE THEY CAUSE MUCH SUFFERING AND LOSS OF TIME, MONEY, AND EFFICIENCY, AND PREDISPOSE TO MORE FATAL MALADIES.

Name or group of disease.	Exciting cause.	Predisposing causes.	Prevention in general.
Syphilis.	A germ, *treponema pallidum*.	Lack of knowledge of the disease, its dangers, and prevention. Prostitution and the social causes which foster it. Lack of moral training. Heredity (syphilis).	Public control of prostitution and white-slave traffic. Home and school training in morals, and instruction in dangers. Nonmarriage of the infected. Individual prophylaxis.
Gonorrhea.	A germ, *diplococcus gonorrhoæ*.	Transmission from mother to child at birth (gonorrhea).	Public control of obstetrical practitioners, doctors and midwives.
Various diseases of women.	Bacterial infections. Mechanical injuries and defects.	Venereal disease. Incompetent medical attention. Overwork and worry. Bad personal hygiene, especially of dress and exercise.	Control of venereal disease. Control of medical practice and midwives. Economic adjustment in favor of employed females. Education in matters of dress and exercise.
Insanity.	Alcoholism, venereal disease. Preceding infection. Worry, mental stress. Head injuries.	Unenlightened attitude regarding insanity. Social conditions. Heredity.	Control of these conditions. Nonmarriage of the insane and defective. Provision for the early hospital and dispensary treatment of incipient and border-line cases.
Malaria.....	Various but similar blood parasites.	Prevalence of certain varieties of mosquitoes. Undrained swamp lands, etc. Unwise choice of summering places.	Getting rid of mosquitoes. Early diagnosis and cure of existing cases.
Hookworm disease.	The hookworm.	Certain climatic and soil conditions. Improper disposal of excreta. Poverty and ignorance. Untreated cases.	Education in causes and dangers. Proper disposal of excreta. Intelligent treatment of all cases.
Drug habits and addiction to patent medicines.	Alcohol, cocaine, morphine, coal-tar drugs, chloral, thyroid extract, etc.	Ignorance. Lack of moral poise. Unwise medical advice. Physical and mental stress.	Education of physicians and laity. Drug laws. High standards of medical practice.
Indigestion and minor stomach and bowel complaints.	Various bacteria and poisonous substances. Poorly cooked food. Unhygienic habits of eating.	Lack of attention to food supplies. Ignorance in the hygiene of diet and cooking.	Public control of the purity of certain foodstuffs. Popular education in these matters.
Common colds.	Various bacteria and poisonous substances.	Bad domestic and personal hygiene. Overcrowded, overheated, unventilated, dusty, and drafty surroundings. Dietary faults.	Education in personal and domestic hygiene. Sanitation of public meeting places and conveyances. Open-air schools.

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